



CHAPTER 1

Configuring UDLD

This chapter describes how to configure UniDirectional Link Detection (UDLD) Ethernet on a Catalyst switch.

This chapter includes the following major sections:

- [About UDLD, page 1-1](#)
- [Default UDLD Configuration, page 1-4](#)
- [Configuring UDLD on the Switch, page 1-4](#)
- [Displaying UDLD Link Status, page 1-9](#)



Note

For complete syntax and usage information for the switch commands used in this chapter, look at the *Cisco Catalyst 4500 Series Switch Command Reference* and related publications at this location:

<http://www.cisco.com/en/US/products/hw/switches/ps4324/index.html>

If the command is not found in the Catalyst 4500 Command Reference, it is located in the larger Cisco IOS library. Refer to the *Cisco IOS Command Reference* and related publications at this location:

<http://www.cisco.com/en/US/products/ps6350/index.html>

About UDLD

UDLD is a Layer 2 protocol that initializes devices connected through fiber-optic or twisted-pair Ethernet cables. This protocol monitors a physical connection (such as wrong cabling) to detect unidirectional links to avoid spanning-tree topology loops or silent drop traffic.

All connected devices must support UDLD for the protocol to successfully identify the unidirectional links. When UDLD detects a unidirectional link, it can administratively shut down the affected port and send you a warning message.

With UDLD, the time to detect a unidirectional link can vary from a few seconds to several minutes depending on how the timers are configured. Link status messages are exchanged every couple of seconds.

Starting with Cisco IOS Release 12.2(54)SG, the enhancement Fast UDLD was added, which supports timers in the few-hundred milliseconds range, which enables subsecond unidirectional link detection. With Fast UDLD, the time to detect a unidirectional link can vary from less than one second to a few seconds (the detection time also depends on how the timers are configured). Link status messages are exchanged every couple of hundred milliseconds.

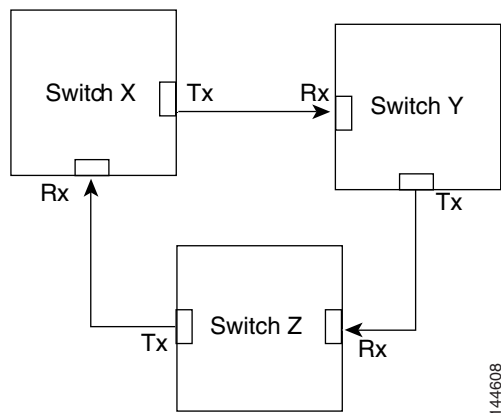
This section includes these topics:

- [UDLD Topology, page 1-2](#)
- [Fast UDLD Topology, page 1-2](#)
- [Operation Modes, page 1-3](#)
- [Default States for UDLD, page 1-3](#)

UDLD Topology

Each switch can send packets to a neighbor switch but cannot receive packets from the switch it is sending packets to. UDLD detects and disables these one-way connections. [Figure 1-1](#) illustrates a unidirectional link condition.

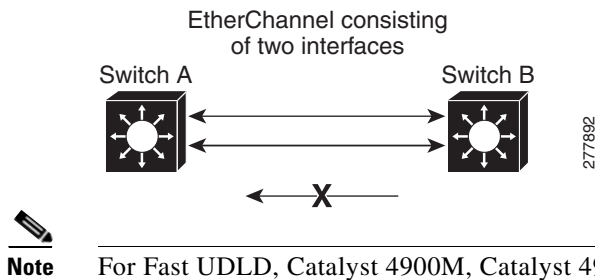
Figure 1-1 Unidirectional Link Topology



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Fast UDLD Topology

[Figure 1-2](#) illustrates a typical Fast UDLD topology. Switch A and B are connected through a 2-port EtherChannel, and Fast UDLD is enabled on the individual ports. If one of the links becomes unidirectional, Fast UDLD detects this situation faster than regular UDLD and errdisables the link. Traffic is switched over to the second link by EtherChannel. Because this occurs very quickly, traffic loss is minimized.

Figure 1-2 Fast UDLD Topology

Note

For Fast UDLD, Catalyst 4900M, Catalyst 4948E, Catalyst 4948E-F, Supervisor Engine 6-E, and Supervisor 6L-E support up to 32 ports. For all other supervisor engines, the limit is 16 ports.

Operation Modes

UDLD and Fast UDLD support the following operation modes:

- **Normal**—A UDLD-capable port (A) periodically sends a UDLD probe to a second port (B). If B is not UDLD capable, no unidirectional link detection occurs. If both devices are UDLD capable and bidirectional connectivity exists, probe messages travel in both directions at the rate of the configured message time interval. When the UDLD protocol receives the probe, it attempts to synchronize the devices by sending echo messages to the peer port and waiting for an answer during the detection window. If unidirectional traffic is detected when the port link is still up (B longer sends traffic to A), B enters errdisable mode, and A is marked undetermined but does not enter errdisable mode. It continues to operate under its current STP status because this mode is informational only; it is potentially less disruptive although it does not prevent STP loops.



Note

Bidirectional link failures cannot be detected using normal mode.

- **Aggressive**—If a port (A) loses its neighbor connectivity, it actively attempts to reestablish the relationship by sending a probe to a second port (B). If port B does not respond, the link is considered unidirectional and port A enters an errdisable state to avoid silent drop traffic.



Note

Both unidirectional and bidirectional link failures can be detected in aggressive mode.

UDLD aggressive mode can interoperate with UDLD normal mode. When a unidirectional condition is detected, only the aggressive mode link shuts down.

Default States for UDLD

The following are the defaults for UDLD:

- UDLD is locally disabled on copper LAN ports to avoid sending unnecessary control traffic (BPDU control packets). This protocol is commonly used for access ports.
- UDLD is enabled on a fiber port if global UDLD is activated.
- Fast UDLD is disabled on all ports.

Default UDLD Configuration

Table 1-1 shows the UDLD default configuration.

Table 1-1 UDLD Default Configuration

Feature	Default Status
UDLD global enable state	Globally disabled.
UDLD per-interface enable state for fiber-optic media	Enabled on all Ethernet fiber-optic interfaces.
UDLD per-interface enable state for twisted-pair (copper) media	Disabled on all Ethernet 10/100 and 1000BASE-TX interfaces.
Fast UDLD per-interface enable state.	Disabled on all interfaces.

Configuring UDLD on the Switch

The following sections describe how to configure UDLD:

- [Fast UDLD Guidelines and Restrictions, page 1-4](#)
- [Enabling UDLD Globally, page 1-5](#)
- [Enabling UDLD on Individual Interfaces, page 1-6](#)
- [Disabling UDLD on Individual Interfaces, page 1-7](#)
- [Disabling UDLD on a Fiber-Optic Interface, page 1-7](#)
- [Configuring a UDLD Probe Message Interval Globally, page 1-8](#)
- [Resetting Disabled LAN Interfaces, page 1-8](#)

Fast UDLD Guidelines and Restrictions

When using (or configuring) Fast UDLD, consider these guidelines and restrictions:

- Fast UDLD is disabled by default.
- Configure fast UDLD only on point-to-point links between network devices that support fast UDLD.
- You can configure fast UDLD in either normal or aggressive mode.
- Do not enter the link debounce command on fast UDLD ports.
- Configure fast UDLD on at least two links between each connected network device. This reduces the number of link disablements due to false positives.
- Fast UDLD does not report a unidirectional link if the same error occurs simultaneously on more than one link to the same neighbor device.
- Fast UDLD is supported on a limited number of ports.

Enabling UDLD Globally

To enable UDLD in aggressive or normal mode and to set the configurable message timer on all fiber-optic interfaces on the switch, perform this task:

	Command	Purpose
Step 1	Switch# configure terminal	Enters the global configuration mode.
Step 2	Switch(config)# udld {aggressive enable message time message-timer-interval} fast-hello error-reporting	<p>Specifies UDLD and Fast UDLD operation:</p> <ul style="list-style-type: none"> • aggressive —Enables UDLD in aggressive mode on all fiber-optic interfaces. • enable —Enables UDLD in normal mode on all fiber-optic interfaces on the switch. UDLD is disabled by default. <p>An individual interface configuration overrides the setting of the udld enable global configuration command.</p> <p>For more information about aggressive and normal modes, see the “Operation Modes” section on page 1-3.</p> <ul style="list-style-type: none"> • message time —message-timer-interval— Configures the period of time between UDLD probe messages on ports that are in the advertisement phase and are determined to be bidirectional. The range is from 1 to 90 seconds. <p>Note Prior to Cisco IOS Release 12.2(31)SGA, the timer range is 7 to 90 seconds. With Cisco IOS Release 12.2(31)SGA, the timer range is 1 to 90 seconds.</p> <ul style="list-style-type: none"> • fast-hello error reporting—If configured, Fast UDLD does not errdisable a unidirectional link. Instead, a log message informing link failure is displayed on the console (behavior for fast UDLD only).
Step 3	Switch(config)# end	Returns to privileged EXEC mode.
Step 4	Switch# show udld	Verifies the configuration.

Enabling UDLD on Individual Interfaces

To enable UDLD on individual interfaces, perform this task:

	Command	Purpose
Step 1	Switch(config-if)# udld port	Enables UDLD in normal mode on a specific interface. On a fiber-optic interface, this command overrides the udld enable global configuration command setting.
	Switch(config-if)# udld port aggressive	Enables UDLD in aggressive mode on a specific interface. On a fiber-optic interface, this command overrides the udld enable global configuration command setting.
	Switch(config-if)# udld fast-hello interval	<p>Enables Fast UDLD on the interface with message interval equal to the <i>interval</i> value in milliseconds.</p> <p>The interval value range is from 200 milliseconds to 1000 milliseconds.</p> <p>To enable Fast UDLD, UDLD must be enabled (explicitly configured or globally enabled) and operational (in bidirectional state) on the interface.</p> <p>Note Fast UDLD can only be enabled on individual interfaces (a global enable command does not exist).</p> <p>Note Fast UDLD can only be configured or enabled on a limited number of interfaces that depend on the type of supervisor installed. The number of supported interfaces for Fast UDLD can be displayed with the show udld fast-hello command.</p>
Step 2	Switch# show udld interface	Verifies the configuration.

Disabling UDLD on Individual Interfaces

To disable UDLD on individual interfaces, perform this task:

	Command	Purpose
Step 1	Switch(config-if)# no udld port	Disables UDLD on an interface. The following applies: <ul style="list-style-type: none"> On fiber-optic interfaces, the no udld port command reverts the interface configuration to the setting established with the udld enable global configuration command. For both UDLD and Fast UDLD, if aggressive mode is configured, then aggressive mode must be explicitly disabled with the no udld port aggressive command. If normal mode is configured, the no udld port command disables both UDLD and Fast UDLD.
	Switch(config-if)# no udld fast-hello	Disables Fast UDLD on an interface. The interface reverts to the UDLD configuration that was present before you enabled Fast UDLD.
Step 2	Switch# show udld interface	Verifies the configuration.

Disabling UDLD on a Fiber-Optic Interface

To disable UDLD on individual fiber-optic interfaces, perform this task:

	Command	Purpose
Step 1	Switch(config-if)# udld port disable	Disables UDLD on a fiber-optic interface and removes all UDLD and Fast UDLD related configuration on the interface. Note You can enable UDLD globally for all fiber-optic interfaces.
	Switch(config-if)# no udld fast-hello	Disables Fast UDLD on an interface, which reverts to the UDLD configuration that was present before you enabled Fast UDLD.
Step 2	Switch# show udld interface	Verifies the configuration.

Configuring a UDLD Probe Message Interval Globally

To configure the time between UDLD probe messages on ports that are in advertisement mode and are currently determined to be bidirectional, perform this task:

	Command	Purpose
Step 1	Switch(config)# udld message time <i>interval</i>	Configures the time between UDLD probe messages on ports that are in advertisement mode and are currently determined to be bidirectional; valid values are from 1 to 90 seconds. Note Prior to Cisco IOS Release 12.2(31)SGA, the time interval is 7 to 90 seconds. With Cisco IOS Release 12.2(31)SGA, the time interval is 1 to 90 second. The no udld message command returns the default value (15 seconds).
Step 2	Switch# show udld <i>type-slot/interface</i>	Verifies the configuration.

Configuring a Fast UDLD Probe Message Interval per Interface

To configure the time between Fast UDLD probe messages on ports that are in advertisement mode and are currently determined to be bidirectional at the interface level, perform this task:

	Command	Purpose
Step 1	Switch(config)# udld fast-hello <i>interval</i>	Configures the time between Fast UDLD probe messages at the interface level.
Step 2	Switch# show udld fast-hello <i>fasttype-slot/interface</i>	Verifies the configuration.

Resetting Disabled LAN Interfaces

To reset all LAN ports that have been errdisabled by UDLD, use this command:

Command	Purpose
Switch(config)# udld reset	Resets all LAN ports that have been errdisabled by UDLD and Fast UDLD.

Displaying UDLD Link Status

To verify link status reported by UDLD, enter the following command:

```
Switch# show udld neighbors
```

Port	Device Name	Device ID	Port ID	Neighbor State
Gi1/33	FOX10430380	1	Gi1/33	Bidirectional
Gi1/34	FOX10430380	1	Gi1/34	Bidirectional

To verify status for a particular link as reported by UDLD, enter the following command:

```
Switch# show udld g1/34
```

```
Interface Gi1/34
```

```
---
```

```
Port enable administrative configuration setting: Enabled / in aggressive mode
Port enable operational state: Enabled / in aggressive mode
Current bidirectional state: Bidirectional
Current operational state: Advertisement - Single neighbor detected
Message interval: 15000 ms
Time out interval: 5000 ms
```

```
Port fast-hello configuration setting: Disabled
Port fast-hello interval: 0 ms
Port fast-hello operational state: Disabled
Neighbor fast-hello configuration setting: Disabled
Neighbor fast-hello interval: Unknown
```

```
Entry 1
```

```
---
```

```
Expiration time: 43300 ms
Cache Device index: 1
Current neighbor state: Bidirectional
Device ID: FOX10430380
Port ID: Gi1/34
Neighbor echo 1 device: FOX104303NL
Neighbor echo 1 port: Gi1/34
```

```
TLV Message interval: 15 sec
No TLV fast-hello interval
TLV Time out interval: 5
TLV CDP Device name: Switch
```

To verify link status reported by Fast UDLD, enter the following command:

```
Switch# show udld fast-hello
```

```
Total ports on which fast hello can be configured: 16
Total ports with fast hello configured: 3
Total ports with fast hello operational: 3
Total ports with fast hello non-operational: 0
```

Port-ID	Hello	Neighbor-Hello	Neighbor-Device	Neighbor-Port	Status
Gi1/45	200	200	FOX104303NL	Gi1/45	Operational
Gi1/46	200	200	FOX104303NL	Gi1/46	Operational
Gi1/47	200	200	FOX104303NL	Gi1/47	Operational

To verify status for a particular link as reported by Fast UDLD, enter the following command:

```
Switch# show udld fast-hello g1/33
```

```
Interface Gi1/33
```

```
---
```

```
Port enable administrative configuration setting: Enabled / in aggressive mode
```

```
Port enable operational state: Enabled / in aggressive mode
```

```
Current bidirectional state: Bidirectional
```

```
Current operational state: Advertisement - Single neighbor detected
```

```
Message interval: 200 ms
```

```
Time out interval: 5000 ms
```

```
Port fast-hello configuration setting: Enabled
```

```
Port fast-hello interval: 200 ms
```

```
Port fast-hello operational state: Enabled
```

```
Neighbor fast-hello configuration setting: Enabled
```

```
Neighbor fast-hello interval: 200 ms
```

```
Entry 1
```

```
---
```

```
Expiration time: 500 ms
```

```
Cache Device index: 1
```

```
Current neighbor state: Bidirectional
```

```
Device ID: FOX10430380
```

```
Port ID: Gi1/33
```

```
Neighbor echo 1 device: FOX104303NL
```

```
Neighbor echo 1 port: Gi1/33
```

```
TLV Message interval: 15
```

```
TLV fast-hello interval: 200 ms
```

```
TLV Time out interval: 5
```

```
TLV CDP Device name: Switch
```